Chapter VII

TRAINING

Introduction

Continuing emphasis on VE training is a prerequisite for realizing the full potential of VE. It is necessary to train personnel to use VE techniques and to establish and maintain a favorable climate for VE within the organization. Although VE courses are a part of the available curricula at several schools and universities, at present VE is not offered as a major subject for academic study, as is, for example, electrical, mechanical, industrial, or civil engineering. Consequently, most organizations must undertake a planned program of VE training in order to acquire sufficient skilled manpower to properly operate a VE program. VE training programs also serve to demonstrate a management interest in the development of additional skills by its employees. Therefore, a good VE training program serves the interest of both management and the employees.

There are several categories of VE training. They are:

- Intensive - designed to teach the VE methodology to those whose responsibilities require it (engineers, designers, etc.)
- Limited - a broad indoctrination or orientation to acquaint staff and management personnel with principles and objectives of VE.
- Contractual - to acquaint Government and contractor personnel with the provisions of the VE contract clauses in the FAR.

These training categories are not mutually exclusive, nor will every organization need to employ all of them at one time. Decisions as to what type are appropriate and who is to be trained depend upon the size and scope of the organization.

Implementing a VE Training Program

A. Training Responsibilities

A VE training program requires participation by many organizational elements. Coordination by a central source is desirable to avoid conflict, duplication, and dilution of the primary effort. A VE training coordinator is generally designated to act as the focal point for the entire effort. Each agency or department may designate one person to coordinate its participation in the training program. Most large DoD and industrial organizations have training staffs, usually as a part of personnel or industrial relations departments. While the primary responsibility for VE training must rest with the VE staff, training personnel play a key role. The latter assist VE personnel by coordinating VE training efforts with the organization's overall training program," training instructors in teaching techniques, and many other types of assistance that only professional educators can provide.

B. Training. Plan

A training plan is normally prepared as a portion of the overall VE program plan. It usually includes:

- An annual training schedule for the organization and for each subordinate component.

- A procedure to assess training effectiveness.

- A method for developing an in-house training capability (if none exists and the size of the organization warrants it).

c. Training Capability Development

The establishment of in-house training capability reflects the needs of the organization. Therefore, the person responsible for this task should be familiar with VE and with the overall needs of the organization. Where no VE program exists, an in-house training capability may be achieved by obtaining initial VE training outside the organization. Courses such as "Principles and Applications of Value Engineering" (PAVE) and "Contractual Aspects of Value Engineering" (CAVE) are available to qualified DoD personnel. These courses are offered periodically by the Army Management Engineering Training Agency (AMETA), at Rock Island Arsenal, Illinois; the Air Force Institute of Technology (AFIT), at Wright-Patterson AFB, Ohio; and at various location-s_ throughout the country. Often, DoD contractor personnel are permitted to attend these course offerings if space is available.

Other sources of VE training available to Government and contractor personnel are:

- Consulting organizations with VE training capability.

- Professional societies (Society of American Value Engineers, Institute of Industrial Engineers, National Contract Management Association, etc.).

- Colleges and universities (UCLA, Northeastern University, Boston University, University of Wisconsin, etc.).

- Large defense contractors.

Upon completion of this outside training, a VE training plan can be formulated which satisfies the specific needs of the organization. The next step is to schedule the first in-house workshop utilizing the services of one or more of the sources listed above. For subsequent workshops, large organizations gradually shift to in-house personnel, utimately developing a complete in-house VE training capability.

Selecting VE Specialists

The typical specialist has a degree in a related discipline or the equivalent in years of experience. For those who are to be trained as full-time VE specialist, it is reasonable to require related academic training in order to enter the field and be able to develop at a reasonable pace. To be successful, a value engineer must exhibit professional competence and be able to present ideas with tact and diplomacy. An effective VE program depends on the skills and persuasiveness of the value e'ngineer to establish close working

relationships with all personnel concerned with value. Thus, communications skills should be considered when selecting those who are to be trained as full-time VE specialist.

Intensive Training

A. Workshop Seminar

Workshop seminars are the main source of formal VE training for operating personnel. Because workshop seminars tend to identify individuals with special aptitude for VE, they also can be considered as one of the first steps in developing qualified full-time value specialists. The seminars provide an opportunity for individuals to display technical and creative abilities and to be observed for evidence of desired communication skills. In addition, workshop seminars give the potential value specialist an opportunity to sample value work before being committed to it. Thus the workshop seminar may be used as a selective filter before proceeding with on-the-job training. In industry, workshop seminars have been successfully conducted by universities, consultants, specialized educational organizations, and by corporations with a VE staff qualified to teach.

The broad objectives of workshop training are to:

- Educate personnel in VE methodology.
- Demonstrate to participating personnel that the methodology is effective.
- Improve communication between all groups concerned with item value.
- Identify personnel who have a special aptitude for VE.
- Develop preliminary data for actual VE proposals.
- Offset part or all of the workshop expenses through savings achieved.

This training gives the individual a thorough understanding of VE and presents a package of specific VE techniques. The basic philosophy underlying most VE training courses is “learn-by-doing”. Even the most dedicated skeptic can be convinced of the efficacy of the principles of VE, if the trainee’s efforts are rewarded by actual savings. Most organizations usually offer VE training during the normal working hours. Some also offer VE training programs during the employees’ off-duty hours. Although the workshop arrangement and curriculum may vary, the following attributes are considered fundamental:

1. Priority of Attendance

-Conflict between the pressures of regular work assignments and workshop attendance must be resolved prior to student selection. Regular attendance at the workshop should be required.

2. Duration and Session Schedule

A range of forty to eighty hours is common. The time is usually divided about fifty-fifty between lecture and project work. Half-day and full-day sessions generally work well; less than half-day sessions have often been found inadequate. The total calendar time between the first session and the last session usually ranges from two to four weeks. Less than two weeks may not provide sufficient turn-around time for the participants to obtain vendor quotations or other cost data for their projects.

3. Participants

Workshop size will vary according to the organizational needs and the availability of experienced personnel to serve as team-project leaders. Experience indicates the optimum group to be about thirty persons. However, satisfactory results have been obtained with larger groups. A larger group requires more careful planning of project work and vendor coordination. Participants at each workshop are drawn from the various line and staff groups such as: engineering (design, project, specification, test), purchasing, manufacturing, reliability, finance, quality assurance, etc. One or more persons from the following are normally scheduled to attend an early workshop: contracts, sales or marketing, industrial relations, and any other element of the organization whose decisions affect value. These individuals may then serve as the VE training contact within their respective areas and could act as team leaders in subsequent workshops. Significant communication improvements are often achieved between Government agencies and contractors through joint workshop participation.

4. Team Organization and Responsibility

Participants are assigned to teams of three to five people for the project portion. A team of four or five permits more complete coverage of advanced VE methodology such as the development of value standards or a cost target plan for the project. Each team is held responsible for the preparation of a report which describes its application of the lecture theory to their work project. Upon completion of the workshop, these reports normally are submitted to the management of the line organization for possible implementation. Many workshops devote their last few hours to oral presentations to management by team members who present the conclusions and recommendations resulting from their project.

5. Workshop Projects

Projects are an essential element of the workshop seminar. The participants, working in teams, apply the VE methodology to something of questionable value. Although the basic purpose of seminar project work is to serve as a training exercise, it should offer an opportunity to realize actual savings. An item or product that possesses the following characteristics is most likely to yield significant savings:

- It is prejudged as susceptible to cost improvement.
- It consists of five to fifty elements.

- Item sample and/or mockup is available.
- Complete drawings, specifications, and cost data are available.
- Total program cost is large enough to achieve a significant saving.
- A responsible designer or equivalent agrees to its use as a project.
- It is designated as “Unclassified” for military security purposes.

Projects are usually selected at least two to four weeks in advance of the workshop. One project per team and a few spares are usually prepared. A distribution of projects representative of the various installations or company activities is desirable. It is not necessary for the participants to have specialized knowledge concerning their projects. A sample data package prepared for a project is included in Figure VII-1 (page 7-9). At the start the team is provided with general guidance including the quantity to--be used in calculating savings, learning curve factors, and a policy for computing the cost of implementing changes.

6. Workshop Leadership

Three types of leadership personnel are used in most VE workshop seminars. First, are lecturers who provide the theory and background of the VE methodology and creative problem solving. They must combine an understanding of their topic with an ability to communicate well. Second, guest speakers are used to bring expert knowledge of other pertinent disciplines such as purchasing, quality control, cost accounting, maintenance, contract administration, cost estimating, etc. Third are the project leaders, usually personnel with VE experience, who provide guidance and enthusiastic leadership for the teams during the project work portion of the seminar.

7. Vendors

Vendors are included in workshops to provide information concerning ideas in production, materials, or processes relative to the projects- Their participation should be planned and scheduled as soon as the projects are selected for maximum use to the students.

8. Curriculum

The lecture schedule, prepared in advance, generally includes a curriculum covering all aspects of the VE methodology as discussed in Chapter VI and VII as well as other pertinent topics such as: internal cost procedures; contractual aspects of VE; relationship of VE to reliability, quality control, and procurement services; etc.

B. On-the-Job Training

On-the-job training is the practical school in which VE trainees learn approved methods of work. They apply the methodology under the tutelage of qualified value specialists and are given the opportunity to learn how to apply basic skills to specific and productive work assignments. In this way, the trainee can be productive while in a training status.

c. Rotational Job Assignments

Such assignments are frequently used in conjunction with on-the-job training. It requires the "trainee" value specialist to be assigned to various organizational areas for limited periods of time. These areas may include manufacturing, cost estimating, methods engineering, design engineering, etc. Exposure to other organization elements broadens the individual's perspective and leads to an improved understanding of the complex nature of product value. As a corollary to this, many companies schedule each of their management trainees for an assignment to the VE staff. These assignments tend to increase the level of understanding between the VE staff and middle management.

Orientation Sessions

The effective indoctrination of appropriate members of the DoD Component and/or contractor's organization from top management down is vital to the success of the overall VE program. VE is a team effort and widespread understanding of the program leads to improved support. The indoctrination presentation is an important part of a well-balanced training effort. This type of training activity, normally performed by staff value specialists generally consists of orientation sessions of from one to twenty hours duration. The sessions introduce the fundamentals, goals, and operation of the VE program. They are intended for audiences other than those expected to attend workshop seminars. This type of presentation is appropriate for personnel whose primary responsibility does not warrant attendance at a full-scale workshop seminar, such as: managers, executives, senior staff personnel, planning personnel, draftsmen, technicians, and newly hired personnel. Although the specific content of indoctrination lectures must be tailored to the needs of the individual activity, they generally include most of the following topics:

- Objectives of VE program.
- Concepts of value.
- Principal VE methods.
- Criteria for applying VE.
- Organization and operation of the VE program.
- Contractual aspects of VE.
- Case histories.
- Relationship and anticipated contribution of the audience to the VE program.

Often these orientation sessions are offered as individual modules in DoD training courses offered at several DoD educational institutions. For example, the course to train program managers includes material to explain VE from a program manager's perspective

Contractual Training

Certain aspects of VE in the defense environment require specialized knowledge of contract management and administration. Training programs to educate personnel in these areas are also necessary. For example, shortly after the implementation of the Armed Services Procurement Regulation (ASPR) VE contract clauses, the need for training those personnel responsible for the administration of these incentives was recognized. A number of courses both within and outside the Government are now offered to explain the concept and operation of the VE portions of the Federal Acquisition Regulation (FAR) and the DoD FAR supplement.

Informal Training

Some organizations choose to train personnel for VE through less formal methods than those previously discussed, or to supplement formal training programs with informal training devices. Some of these informal training approaches are:

- Handbooks and manuals are a means of bringing about a climate of cost awareness throughout the organization. The manuals can be used to demonstrate how to perform VE while the handbooks provide cost data relating to trade-off possibilities, process information, etc.

- Bulletins and newsletters, distributed periodically, containing a section devoted to VE methodology. They act as continuing reminders to employees of the need for better value.

- Technical meetings at which VE films or speakers from other facilities are presented.

- Displays of successful VE case histories may be placed on bulletin boards and other locations throughout the organization. Some organizations have extensive displays in lobbies, visitor and personnel reception rooms, etc.

Summary

Training is an important element of a comprehensive VE program that requires proper emphasis if VE is to reach its full potential. A planned training program is needed to provide the necessary skilled personnel for the DoD VE program. Responsibility for the training program is usually assigned to a VE training coordinator, who develops and implements a total training plan. The plan may include the development of an in-house training capability if the size of the organization justifies such an effort. A distinction should be made between. full-time ..training and indoctrination efforts. Workshops may serve as a first step for training value specialists and are the principal

means of training other personnel in VE. The training program for value specialists is necessarily more detailed and includes on-the-job training as well as formal instruction. Rotational assignments are often used to improve the value specialist's understanding of the complex nature of product value as well as familiarize management trainees and others with VE.

DATA PACKAGE FOR WORKSHOP PROJECTS

NOTE : This is not intended as an exhaustive listing but rather as a guide to important considerations.

Drawings, layouts of sketches
- Next assembly
- Assembly
- Detail parts
- Schematics

Cost (actual and/or anticipated)
- Tooling
- Raw material
- Outside purchased parts, tooling
- Inspection
- Fabrication
- Assembly
- Anticipated models

Manufacturing planning and status
- Tooling description
- Handling equipment
- Planning sheets

- Scrap loss
- Lot size
- Packing and shipping

Contact points (names, location, telephone)
- Responsible designers
- Responsible buyers
- Responsible cost analyst
- Specialty consultants
  - Theory
  - Fabrication
  - Quality
  - ‘Field services

Specifications (performance, model, process)
- Customer
- Internal
- Subcontractor

Design criteria and status
- Intended function
- Weight
- Reliability
- Known problem areas
- Design history
- Fabrication history

Figure VII-1

- Procurement history
- Associated documentation
- Manuals
- Handbooks
- Reports

Contract data
- Incentive
- Quality required
- Anticipated future quantity

Purchasing data
- Responsible buyer
- Participating vendors

Photographs

Figure VII-1 (continued)